

### **REMARKS**

This application has been reviewed in light of the Office Action mailed on December 15, 2003. Claims 1-12 are pending in the application with Claims 1 and 12 being in independent form. By the present amendment, Claims 1, 3, 4, 11 and 12 have been amended. No new matter or issues are believed to be introduced by the amendments.

#### **I. Objection of Fig. 1 Under 37 C.F.R. §1.84(h)(5)**

Fig. 1 is objected to under 37 C.F.R. for showing modified forms of construction in the same view. Fig. 1 has been amended to show a first form of construction and Fig. 2 has been added illustrating a second form of construction. Additionally the specification has been amended to refer to amended FIG. 1 and newly added FIG. 2. Withdrawal of the objection is respectfully requested.

#### **II. Objection to the Abstract of the Disclosure**

The abstract of the disclosure is objected to for the use of phrase which can be implied. The abstract has been amended to recite:

“An X-ray detector module (1) is provided, in which a preferably metallic carrier (3) forms tubular cells (4) in which there is provided a mixture of a binder (7) and scintillator particles (6). The absorption of X-rays by the scintillator particles (6) gives rise to the emission of light of a longer wavelength ( $\lambda_1, \lambda_2$ ) that can be detected by a detector (5) arranged at the far end of the cells (4). In order to keep the light yield as high as possible, a difference of less than 20% is pursued between the refractive indices of the binder (7) and the scintillator particles (6) and/or nano-crystalline scintillator particles (6) of a size of between 1 and 100 nm are used.

Preferably, the cell walls (3, 3') are extended in the direction of incidence of the X-rays in order to form an anti-scatter grid above the detector."

### **III. Objection to Paragraph 3 of Page 4 of the Disclosure**

Paragraph 3 of page 4 of the disclosure is objected to for the use of a degree symbol where a percent symbol would be more appropriate. Examiner's recommendation has been applied to the amended paragraph 3 of page 4. Withdrawal of the objection is respectfully requested.

### **IV. Objection to Claims 3 and 11 Under 37 C.F.R. §1.75(c)**

Claims 3 and 11 are objected to under 37 C.F.R. §1.75(c). Claims 3 and 11 have been amended in a manner believed to obviate the objection under 37 C.F.R. §1.75(c).

Claim 3 has been amended to recite in part: "An X-ray detector module, as claimed in claim 1...". Claim 11 recites similar language. Accordingly, withdrawal of the objection of Claims 3 and 11 under 37 C.F.R. §1.75(c) is respectfully requested.

### **V. Rejection of Claim 12 Under 35 U.S.C. §112, First Paragraph**

Claim 12 is rejected to under 35 U.S.C. 112, first paragraph as failing to comply with the enablement requirement.

Amended Claim 12 recites: "A method of manufacturing an X-ray detector module (1) as claimed in at least one of the claims 1 to 11, where a free-flowing mixture of a binder (7) and scintillator particles (6) is deposited at least once in the cells (4) of a carrier (3), subsequently, the mixture is densified by thermal treatment and/or by UV irradiation." (emphasis added)

The method of manufacturing as recited in amended Claim 12 is supported and enabled in page 6, first paragraph. Withdrawal of the rejection of Claim 12 under 35 U.S.C. §112, first paragraph and allowance thereof are respectfully requested.

**VI. Rejection of Claims 1, 4-10 and 12 Under 35 U.S.C. §103(a)**

Claims 1, 4-10 and 12 are rejected under 35 U.S.C. §103(a) over UK Patent Application No. 2,167,279A issued to Ian Redmayne ("Redmayne") in view of U.S. Patent No. 4,375,423 issued to Cusano et al. ("Cusano et al.").

Amended Claim 1, recites in part: "...wherein a mass of scintillator particles (6), having a particle size in the range of between 1nm and 100nm, that are embedded in a binder (7)...". (emphasis added) The newly added limitations, underlined above, provides a specific limit on scintillator grain size.

Redmayne discloses an X-Ray detector comprising an array of scintillation elements embedded in a sheet of radiation absorbing material. Additionally, Cusano et al. discloses scintillator particles embedded in a binder. Neither Redmayne nor Cusano et al. specify a range of acceptable grain sizes for the scintillator particles as is claimed in Applicant's Claim 1.

Reference is made in the present office action to U.S. Patent No. 6,534,772 issued to Chhabra et al., ("Chhabra et al.") in rejecting Applicant's Claim 3, which recites particle size. Chhabra et al. discloses scintillator particles with dimensions between the range of .1 microns to 40 microns, referred to as micron-sized particles. Additionally, Chhabra et al. teaches away from using particles smaller than the above cited micron-sized particles. According to Chhabra et al., phosphors that are too small create thousands of scattering surfaces, which reduces the light output of the microchannel (Column 8, Lines 8-11), thus teaching away from Applicant's

claimed particle size range of between 1nm and 100nm – nanometer-size particles as opposed to micron-sized particles. The use of these nanometer-sized particles makes it possible to keep the disturbing scattering of re-emitted light photons small enough that a suitable signal level can be obtained for the X-ray detector module, as stated in the application.

Therefore, Redmayne and Cusano et al., along with the additional Chhabra et al. reference, taken alone or in any proper combination do not disclose or suggest the particle size limitations of Applicant's Claim 1. Accordingly, it is believed that Claim 1 is patentably distinct over the prior art references and accordingly, withdrawal of the rejection with respect to Claim 1 under 35 U.S.C. §103(a) over Redmayne in view of Cusano et al. and allowance thereof are respectfully requested.

Claims 4-10 and 12 depend from independent Claim 1 and thus are limited by the language recited by this independent claim. Therefore, for at least the reasons given above, Claims 4-10 and 12 are believed to be patentably distinct over the prior art references and accordingly, withdrawal of the rejection with respect to Claims 4-10 and 12 under 35 U.S.C. §103(a) over Redmayne in view of Cusano et al. and allowance thereof are respectfully requested.

#### **VII. Rejection of Claim 2 Under 35 U.S.C. §103(a)**

Claim 2 is rejected under 35 U.S.C. §103(a) over Redmayne and Cusano et al. and in further view of U.S. Patent No. 4,563,584 issued to Hoffman et al. ("Hoffman et al."). The rejection is respectfully traversed.

Claim 2 depends from independent Claim 1 and thus is limited by the language recited by this independent claim. Therefore, for at least the reasons given above for Claim 1, Claim 2 is

believed to be patentably distinct over the prior art references. Accordingly, withdrawal of the rejection with respect to Claim 2 under 35 U.S.C. §103(a) over Redmayne in view of Cusano et al. and in further view of Hoffman et al. and allowance thereof are respectfully requested.

**VIII. Rejection of Claims 3 Under 35 U.S.C. §103(a)**

Claim 3 is rejected under 35 U.S.C. §103(a) over Redmayne and Cusano et al. and in further view of U.S. Patent No. 6,534,772 issued to Chhabra et al. ("Chhabra et al.").

Claim 3 depends from independent Claim 1 and thus is limited by the language recited by this independent claim. Therefore, for at least the reasons given above for Claim 1, Claim 3 is believed to be patentably distinct over the prior art references. Accordingly, withdrawal of the rejection with respect to Claim 3 under 35 U.S.C. §103(a) over Redmayne in view of Cusano et al. and in further view of Chhabra et al. and allowance thereof are respectfully requested.

**IX. Rejection of Claims 11 Under 35 U.S.C. §103(a)**

Claim 11 is rejected under 35 U.S.C. §103(a) over Redmayne and Cusano et al. and in further view of U.S. Patent No. 5,712,483 issued to Boone et al. ("Boone et al.").

Claim 11 depends from independent Claim 1 and thus is limited by the language recited by this independent claim. Therefore, for at least the reasons given above for Claim 1, Claim 11 is believed to be patentably distinct over the prior art references. Accordingly, withdrawal of the rejection with respect to Claim 11 under 35 U.S.C. §103(a) over Redmayne in view of Cusano et al. and in further view of Boone et al. and allowance thereof are respectfully requested.

**X. Conclusions**

In view of the foregoing remarks and amendments, it is respectfully submitted that all claims presently pending in the application, namely, Claims 1-12, are believed to be in condition for allowance and patentably distinguishable over the art of record.

If the Examiner should have any questions concerning this communication or feels that an interview would be helpful, the Examiner is requested to call John Vodopia, Esq., Intellectual Property Counsel, Philips Electronics North America, at 914-333-9627.

Respectfully submitted,

A handwritten signature in cursive script, appearing to read "George Likourezos", written over a horizontal line.

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